

WHAT IS CLAIMED IS:

5 1. A remote-detection system for monitoring the physiological activity of a subject, comprising:

a source containing an oscillator configured to illuminate the subject with an electromagnetic signal beam; and

10 a receiver configured to observe changes in the amplitude of the electromagnetic signal reflected by the subject.

2. The remote-detection system of claim 1, wherein:

the source also includes a first antenna portion; and

the receiver includes a second antenna portion connected to a detector.

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3. A remote-detection system for detecting physiological activity of a subject, comprising:

an RF oscillator connected to a first antenna portion, where the RF oscillator and the antenna are configured to generate a electromagnetic signal beam that illuminates the subject; and

20 a detector connected to a second antenna portion, where the second antenna portion and detector are configured to generate a signal indicative of the amplitude of the electromagnetic signal reflected by the subject.

25 4. The remote-detection system in claim 3, wherein the RF oscillator and the detector are directionally coupled to a single antenna that acts as the first and second antenna portions.

5. The remote-detection system in claim 3, wherein the electromagnetic signal is reflected from the surface of the subject and the detector is configured to detect variations in the amplitude of the electromagnetic signal reflected from the surface of the subject.

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6. The remote-detection system of claim 3, wherein:

the subject has a beating heart;

the complex impedance of the heart changes as it beats;

35 the amplitude of reflected electromagnetic signal changes as the complex impedance of the heart changes; and

the detector is configured to detect variations in the amplitude of the electromagnetic signal reflected by the changes in the complex impedance of the beating heart.

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7. A remote-detection system for monitoring the physiological activity of a subject, comprising:

means for illuminating the subject with an electromagnetic signal; and

10 means for observing changes in the amplitude of the electromagnetic signal reflected by the subject.

8. A method of detecting the presence of life in an area containing debris, comprising:

15 illuminating an area with an electromagnetic signal having a wavelength that renders at least some of said debris transparent;

detecting the amplitude of reflections of the electromagnetic signal and observing variations in the amplitude.

20 9. A method of monitoring the physiological activity of a subject, comprising:

illuminating the subject with an electromagnetic signal beam; and

observing changes in the amplitude of the electromagnetic signal reflected by the subject.

25 10. The method of claim 9, further comprising observing the electromagnetic signal reflected by the beating of the heart of the subject.

11. The method of claim 9, further comprising observing the electromagnetic signal reflected by changes in the complex impedance of the body of the subject.

30 12. The methods of claims 10 and 11, further comprising filtering the observed electromagnetic signal reflected by the surface of the subject.

13. A method of generating an electrocardiogram, comprising:

illuminating a heart with an electromagnetic signal beam; and

35 detecting the amplitude of the electromagnetic signal reflected by the heart.

5 14. The method of claim 13, wherein detecting the amplitude of the electromagnetic signal reflected by the heart, further comprises:

low-pass filtering a signal indicative of the amplitude of reflected electromagnetic signal; and

performing digital signal processing to produce a signal indicative of the amplitude of the electromagnetic signal reflected by the heart.